



NOAA Water Initiative

Communities around the country are becoming more vulnerable to natural disasters and long-term adverse environmental changes. 2015 was the warmest year on record and saw 10 weather, water, and climate disaster events, including flooding, coastal inundation, and drought, with losses each exceeding \$1 billion. These events devastated communities while impacting national agricultural, manufacturing, and energy production.

At the heart of many of these environmental threats is water—either there is too much, not enough, or it is of poor quality. This is heightening the demand for more integrated water intelligence and prediction capabilities to inform decision-making at all levels about how best to keep communities safe, resilient, and prosperous.



- Major flooding across America's heartland in January, 2016 placed 7 million people in 15 states at risk. Water managers outside New Orleans had to reduce the height of the rising Mississippi by opening a spillway – the 11th time since 1931.
- More than 40 million Americans have been affected by drought in 2016. In the West, a crippling 4-year drought has led to over-pumping of groundwater and water restrictions for consumers and businesses.
- With over 40% of the U.S. population living within 100 miles of the coast, Hurricane Sandy and other coastal storms are compelling coastal managers to better plan for future sea level rise, storm surges, and flooding.
- Changes in water temperature, flooding, and land use are linked to the frequency and magnitude of harmful algal blooms, which now affect every U.S. coastal and Great Lakes state. Algal toxins can contaminate drinking water, and kill wildlife, and have cost the U.S. economy at least \$82 million annually.

As the nation's premier environmental prediction agency, NOAA is uniquely positioned to bring new insights to the water challenges facing this country. Over the next five years and with support from Congress, NOAA will launch a broad Water Initiative to provide more deeply integrated water predictive capabilities to promote water resiliency across sectors and scales. In FY 2017, as the first step in this Initiative, NOAA is establishing Integrated Water Prediction (IWP) to deliver a suite of more holistic water intelligence products to help communities and industries make better-informed decisions about water management and how to prepare for and respond to extreme water events. IWP specifically brings together the National Weather Service (NWS) and the National Ocean Service (NOS) to transform the nation's water prediction capabilities, particularly at the coast.



Integrated Water Prediction at NOAA

NOAA's IWP transforms NOAA's existing water forecasting capability by dramatically improving the density of NOAA's river forecasting models nationwide, and combining them with coastal and storm surge models at the coast. IWP will provide new information vital for decision making both during high-impact events (e.g., hurricanes, nor'easters, storm surge) and for routine water management (e.g., ecosystem health, low flow, transportation, agriculture). The new operational services funded through IWP will begin in the later part of FY 2017 and include:

- The National Water Model which was developed in FY 2015 and 2016 and provides the framework for IWP. This forecasting framework will deliver enhanced inland river and stream forecasts, including neighborhood-scale water information for every stream reach in the United States. Information from this model will be generated hourly and delivered via a 14 hour-to-7-day (14/7) national water forecast as well as a 30-day water outlook for the entire nation.
- A new generation of water-level products for coastal storms that links coastal and terrestrial water impacts. This will generate an integrated water impact assessment that communities can use to more accurately anticipate the combined water level at the coast, providing new forecasts to Americans in coastal communities who do not receive a hydrological forecast.
- A 14/7 water operations center at the NWS National Water Center (NWC) in Alabama to synthesize stream forecasts in collaboration with River Forecast Centers, and provide daily impact-based decision support services during flood and drought emergencies.
- New region-specific workshops and vulnerability analyses based on combined total water prediction and geospatial information to improve community-level water forecasting and deliver risk assessments, especially in coastal regions.

